



# Understanding by Design<sup>®</sup> In the IB Diploma

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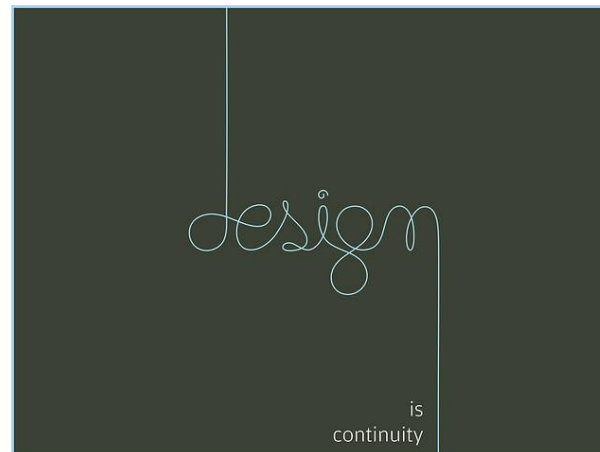
# Learning outcomes

- What is Understanding by Design® (UbD™)?
- How does UbD enhance the delivery of the IB Diploma curriculum?
- What is the language of UbD?
- What does a UbD unit planner look like?
- Examples of UbD units and assessments
- How can I introduce a UbD-type model into my planning?
- Where can I find additional information about UbD?



# Understanding by Design

- A framework for improving student achievement.
- Emphasizes the teacher's critical role as a designer of student learning.
- Works within the standards-driven curriculum.
- Helps teachers to clarify learning goals, devise revealing assessments of student understanding, and craft effective and engaging learning activities.



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# Understanding by Design

- Effective curriculum is planned backward from long-term, desired results through a three-stage design process
  - Desired Results
  - Evidence
  - Learning Plan
- Understanding is revealed when students autonomously make sense of and transfer their learning through authentic performance.



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# Understanding by Design with the IB Diploma

- Aligns planning from PYP to MYP to DP



Approaches to Learning (AtLs) are developed in this model

- Thinking skills
- Communication skills
- Social skills
- Self-management skills
- Research skills

Approaches to teaching addressed when using UbD

- IB focus on experiential learning put into practise
- IB internal assessments moving closer to UbD assessment practises e.g. Mathematics exploration

## Stage 1 Desired Results

<p>ESTABLISHED GOALS</p> <p>(IB Curriculum Assessment objectives / per subject)</p>	<i>Transfer</i>	
	<i>Students will use their learning independently to...</i>	
	<i>Meaning</i>	
	<p>UNDERSTANDINGS</p> <p><i>Students will understand that...</i></p>	<p>ESSENTIAL QUESTIONS</p> <p><i>Students will continue to consider...</i></p>
	<i>Acquisition</i>	
	<i>Students will know...</i>	<i>Students will be skilled at...</i>
	<i>Learning skills</i>	
	<p>APPROACHES TO LEARNING</p> <p><i>Students will have opportunities to develop their ability in...</i></p> <p><input type="checkbox"/> Organization    <input type="checkbox"/> Collaboration</p> <p><input type="checkbox"/> Communication    <input type="checkbox"/> Information literacy</p> <p><input type="checkbox"/> Reflection    <input type="checkbox"/> Thinking</p> <p><input type="checkbox"/> Transfer</p>	<p>LEARNER PROFILE</p> <p><i>Students will have chances to work on becoming...</i></p> <p><input type="checkbox"/> Inquirers    <input type="checkbox"/> Knowledgeable    <input type="checkbox"/> Balanced</p> <p><input type="checkbox"/> Thinkers    <input type="checkbox"/> Communicators    <input type="checkbox"/> Principled</p> <p><input type="checkbox"/> Caring    <input type="checkbox"/> Open-minded</p> <p><input type="checkbox"/> Risk-takers    <input type="checkbox"/> Reflective</p>
	<i>Cross-curricula links (not always necessary)</i>	
	<p>INTERDISCIPLINARY LINKS</p> <p><i>Which subject and how is this linked?</i></p>	<p>TOK LINKS</p> <p>Ways of knowing</p> <p><input type="checkbox"/> Memory    <input type="checkbox"/> Language    <input type="checkbox"/> Reason</p> <p><input type="checkbox"/> Emotion    <input type="checkbox"/> Imagination    <input type="checkbox"/> Intuition</p> <p><input type="checkbox"/> Faith    <input type="checkbox"/> Sense perception</p> <p>Linking questions</p> <p><input type="checkbox"/> Belief    <input type="checkbox"/> Certainty    <input type="checkbox"/> Culture</p> <p><input type="checkbox"/> Evidence    <input type="checkbox"/> Experience    <input type="checkbox"/> Explanation</p> <p><input type="checkbox"/> Interpretation    <input type="checkbox"/> Intuition    <input type="checkbox"/> Truth</p> <p><input type="checkbox"/> Values</p>

## Stage 2 - Evidence

<b>Evaluative Criteria</b>	<b>Assessment Evidence</b>
	PERFORMANCE TASK(S) ( <i>Remember G-R-A-S-P-S</i> ):
	OTHER EVIDENCE:

### Stage 3 – Learning Plan

#### Key Learning Events and Instruction

##### How do the assessments and learning experiences...

- Promote critical thinking and problem solving?
- Encourage creativity and innovation?
- Promote communication skills?
- Encourage leadership opportunities?
- Incorporate appropriate thinking strategies?
- Integrate technology and media skills?
- Address individual student needs?
- Have real-world connections (or relevancy) for students?

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#### Resources

<type here>

### Stage 4 - Reflection

#### Reflections on your unit

##### Considerations:

- What worked well?
- What needs improvement or change? (Pacing notes, future curriculum links and enhancement etc.)

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# Mathematics HL:

# Exponential and logarithmic functions

## Learning Goals

*Students will use their learning independently to...*

- Understand where logarithmic functions are found in real life, and what role they play in different situations.
- Know how to determine if a graph represents growth or decay.
- Understand how simple and compound interest works in real world problems.
- Apply logarithmic functions and their properties in modelling and in real word situations.
- Use different properties of logarithmic functions to manipulate equations in order to find solutions.

## Making Meaning

### Understandings

*Students will understand that...*

*it is important to develop logical, critical and creative thinking, and patience and persistence in problem-solving. (Overarching Understanding)*

- there are formulas which relate to exponential growth and decay and compound interest.
- natural log,  $e$ , holds mathematical importance, and is related to interest.
- logarithmic functions can be used for different purposes and applied to real world situations.
- the properties of logarithmic functions can be related to exponents.

### Essential Questions

*Students will continue to consider...*

- What are the connections between logarithmic functions and real world problems?
- When is compound interest used, and how can one find the best deal?
- Where can exponential growth be used to model real life problems?

## Knowledge and Skill Development

### Knowledge

*Students will know...*

- Exponential and Logarithmic functions.
- How to determine if a graph is representing growth or decay. Properties of exponents and logarithms.
- Applications that use exponential and logarithmic functions to model real-world growth and decay scenarios.
- The inverse of the exponential function is the log function.
- The history and purpose of logarithms.
- Transformations of exponential and logarithmic equations.

### Skills

*Students will be skilled at...*

Basic skills: Computation  
Thinking skills: Comparing & analysing  
Technology: Using the TI 84+ calculator  
Answering: IB1 HL paper 1 and 2 questions

Specific skills for this unit:

- Apply the laws of logarithms in order to simplify expressions and solve equations
- Simplify problems involving rational exponents
- Change problems between logarithmic form and exponential form
- Write exponential equations and graph them on a coordinate plane.



# Exponential and logarithmic functions

## Assessment: Performance task



### MATHEMATICS HIGHER LEVEL PERFORMANCE TASK ALGEBRA: EXPONENTS AND LOGARITHMS

#### DRUG TRIALS

**Goal:** You are modelling population decay of a drug in the bloodstream.

**Role:** You are a statistician working for a pharmaceutical company.

**Audience:** Your boss

**Situation:** You have been asked to research a particular drug's efficiency and write a report for the company.



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**Product Performance:** You should use exponential or logarithmic functions. You should examine the growth and/or decay functions of the drug. You must include all calculations as proof in your report as accurately as appropriate.

**Standards:** You will be assessed using the IB Internal Assessment criteria with a maximum of 20 points.

# History SL and HL: The Cold War

## Learning Goals

*Students will use their learning independently to...*

*Transfer Goal: To analyze events that are portrayed in both primary and secondary sources using both historical context and historiography to arrive at measured viewpoints that are communicated in a variety of formats.*

## Making Meaning

### Understandings

*Students will understand that...*

- Conflicts (such as the Cold War) have multiple, varied origins that are not necessarily directly linked to the actual conflict.
- The development, nature, and effects of complex historical phenomena (e.g. spheres of influence) are often interpreted differently by various leaders as well as historians.
- Ideological differences impact economic, social, and political policies.
- An arms race is a multi-faceted affair that may or may not lead to war.
- Alliances and political aid (e.g. NATO, Warsaw Pact, COMECON, Non-Alignment Movement, Marshall Plan, Truman Plan) have multiple causes and effects that ultimately impact the balance of power in a conflict.
- Many Cold War conflicts grew out of World War II and post-war internal German affairs.
- Policies (e.g. containment, anti-containment) may be interpreted to be both defensive and offensive depending upon perspective.
- Proxy wars (e.g. Korea, Cuba, Vietnam, Middle Eastern) are used by superpowers to shift the balance of power in bilateral struggles.
- A comprehensive peace process (such as détente) often correlates to arms reduction efforts.
- Civil disturbances (such as in Hungary, Czechoslovakia, and Poland) often have both domestic and foreign roots.
- Various reasons exist for the destruction of any great civilization or empire.

### Essential Questions

*Students will continue to consider...*

- What are the economic, social, and political origins (E-S-P) of the Cold War?
- How did spheres of influence arise, what was the nature of these spheres, and in what ways did they affect the Cold War?
- To what extent did ideology impact the Cold War?
- How did MAD (mutually assured destruction) affect the balance of power and prevent war (if it did) during the arms race?
- What were the causes and effects of containment and anti-containment policies?
- In what ways, and to what extent, was Germany the center of the Cold War?
- How are proxy wars utilized to shift the balance of power?
- What are the elements of a peace process?
- How are civil disturbances linkable to domestic and foreign factors?
- What factors (E-S-P) led to the fall of communism in Eastern Europe and the USSR?
- What are the values and limitations of key primary and secondary sources?
- How do orthodox, revisionist, post-revisionist, and Soviet historians view the causes of the Cold War, its development, and its resolution?

## Knowledge and Skill Development

### Knowledge

*Students will know...*

- The vocabulary and terminology associated with the Cold War as well as the meaning of key terms in IB-styled questions associated with Paper 1 and Paper 2. Moreover, students will know IB command terms for this subject.
- The nature of the various periods associated with the Cold War (e.g. origins, beginning, peaceful co-existence, end of peaceful co-existence, detente, end of detente, and fall of communism).
- A variety of narratives related to Cold War conflicts.
- The geo-political dimensions of the various disputes in the Cold War.
- The effects of the Cold War on 3rd parties (outside the USA and USSR).

### Skills

*Students will be skilled at...*

- Source analysis (both primary and secondary)
- Interpretation of historiography
- Analysis of causes and effects
- IB Paper 1 and Paper 2 answer techniques

# Interdisciplinary Assessment: Performance task

## COLD WAR: Performance Task (for Language and Literature and History)

### Transfer Goals:

- To understand rhetoric (both its strengths and weaknesses)
- To analyze sources in terms of origins, purpose, value and limitations
- To place a source in a historical context



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**Dates:** Begin preparations (reading articles) in late March and complete in early April

**Goal** – Analyse a political speech for use of rhetoric and general content. Create an effective speech to be given in opposition.

**Role** – Propaganda team for your chosen political leader.

**Audience** – Your chosen political leader.

**Situation** – The political opposition is gaining traction with their ideas and appeals to the international community. You need to offer your political leader an effective analysis of their opponent’s recent speech and provide an alternative speech that will effectively work in opposition. Your boss will definitely need some convincing!

**Product** – A presentation analyzing the rhetoric and content of the opposition’s recent speech, followed by a reading of the alternative speech with an explanation of why you feel it will be an effective response.

**Directions:** You will choose one of the Cold War speeches listed below. After reading the speech, you, as a member of an opposition leader’s propaganda team, will prepare an analysis of what is being said, how truthful it is and how it is communicated through effective rhetoric. You will want to focus on why the speech is so powerful / effective but you should also consider its weaknesses and flaws.

After your analysis you must draft a speech for your leader in opposition to the speech that you have read. You must take into consideration:

# Movement!



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- When the music stops, introduce yourself to someone
  - Your name
  - Your subject area
  - Something you have taught in the IB Diploma which you enjoyed



# New places please!

- Sit at the table in the group subject you teach
  - Table 1 – Studies in literature and language
  - Table 2 – Language acquisition
  - Table 3 – Individuals and societies
  - Table 4 – Sciences
  - Table 5 – Mathematics
  - Table 6 – The Arts



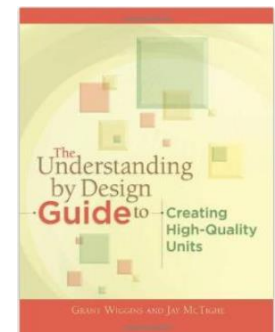
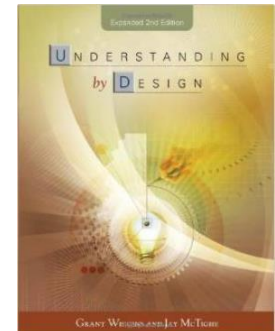


# Working in your new groups

- Consider a recent unit you have taught.
  - Transfer
    - What was the key knowledge which you wanted students to be able to apply in different contexts?
  - Understandings
    - What is it that you want students to remember a significant time period after the unit is finished?
  - Essential questions
    - What questions can you ask which are open-ended, thought-provoking and intellectually engaging
      - Use higher-order thinking (e.g. analysis, inference, evaluation, prediction),
      - Points towards transferable ideas
      - Raise additional questions
      - Requires justification
      - Revisit the question throughout the unit
  - Knowledge and skills
    - What targeted knowledge and skills are needed for the understanding-related goals?
      - Include key vocabulary and IB command terms

# Resources

- Understanding by Design® Framework
  - [http://www.ascd.org/ASCD/pdf/siteASCD/publications/UbD\\_WhitePaper0312.pdf](http://www.ascd.org/ASCD/pdf/siteASCD/publications/UbD_WhitePaper0312.pdf)
- Authentic Education website (what is UbD?)
  - <http://www.authenticeducation.org/ubd/ubd.lasso>
- What is Understanding by Design? Author Jay McTighe explains.
  - <https://www.youtube.com/watch?v=d8FI5nWalfE>
- Understanding by Design by Grant P.Wiggins and Jay McTighe
  - 978-1416600350
- Understanding by Design Professional Development Workbook by Jay McTighe and Grant P.Wiggins
  - 978-0871208552
- The Understanding by Design Guide to Creating High-Quality Units by Grant P.Wiggins and Jay McTighe
  - 978-1416611493





# Learning outcomes

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# Questions?



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